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Alberta
HUMAN RESOURCES AND EMPLOYMENT
the people & workplace department

July 2002

# Occupational Injuries and Diseases in Alberta

## Drilling of Oil and Gas Wells 1997 to 2001

## Upstream Oil and Gas Sub-Sector #4

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# 1. Introduction

Alberta Human Resources and Employment (AHRE) invests in people and workplaces. AHRE develops and delivers programs and services, which contribute to workplaces that are safe, healthy, fair and stable for employees and employers. Workplace Health and Safety is part of the continuum of services provided by Alberta Human Resources and Employment. The Department promotes the development of effective work site health and safety management systems and compliance programs and supports fair and effective resolution of workplace issues. AHRE works in partnership with Alberta Workers' Compensation Board (WCB), safety associations, employers, workers and labour to promote prevention of workplace injuries and diseases.

To this end, AHRE recognizes that monitoring workplace health and safety will help to ensure that primary concerns are actively managed and that resources are directed where needed. To parallel the increase in workforce covered by Alberta legislation, the number of Occupational Health and Safety officers dedicated to enforcement was increased. The officers are responsible for: ensuring that workers and employers are knowledgeable about Occupational Health and Safety Act; investigating serious incidents, fatalities and complaints; performing workplace inspections; and ensuring compliance with regulations if employers are found to be in violation.

*Role of Alberta Human Resources and Employment*

AHRE helps employers and workers ensure safe, healthy and productive workplaces in Alberta by:

- Providing workplace health and safety information and assistance to all Albertans.
- Investigating serious incidents and complaints about potential work site hazards.
- Partnering with industry leaders and safety associations to develop health and safety programs.
- Enforcing the *Occupational Health and Safety Act.*

This report summarises the lost-time injuries and disease descriptions, characteristics of the injured worker and the risk of injury to workers in Alberta's upstream oil and gas industries for the years 1997 to 2001. Cost of the injuries and revenue in terms of total premiums paid by employers are presented as well. Finally, a summary of occupational fatalities accepted by the WCB for compensation and brief descriptions of fatalities investigated by AHRE are also provided.

The purpose of this report is to provide government, employers, workers and health and safety officers in upstream oil and gas industries with information about the industry key health and safety issues.

*Business Rules*

**Lost-Time Claim Rate**
The lost-time claim rate can only be considered reliable for employers with 40 or more person years; it is recommended that the lost-time claim rate not be calculated based upon fewer than 40 person years.

**Duration Rate**
Duration rate is highly unstable when based on a few lost-time claims; it is recommended that the duration rate not be calculated based upon fewer than 30 lost-time claims.

**Percent**
Percents may not add up to a 100 because of rounding.

*Description of Upstream Oil and Gas Industries*

The upstream oil and gas industries can be subdivided into the following sub-sectors.

Exploration, Oilfield Maintenance and Construction, Well Servicing with Service Rigs including Power Swivels, Drilling of Oil and Gas Wells, Downhole and Other Oilfield Services, Tar Sands, Oil and Gas Exploration and Development, and Oilfield Trucking Services.

The next section gives the descriptions of the Drilling of Oil and Gas Wells sub-sector.

## 2. Sub-Sector Description

### Sub-Sector #4: Drilling of Oil and Gas Wells

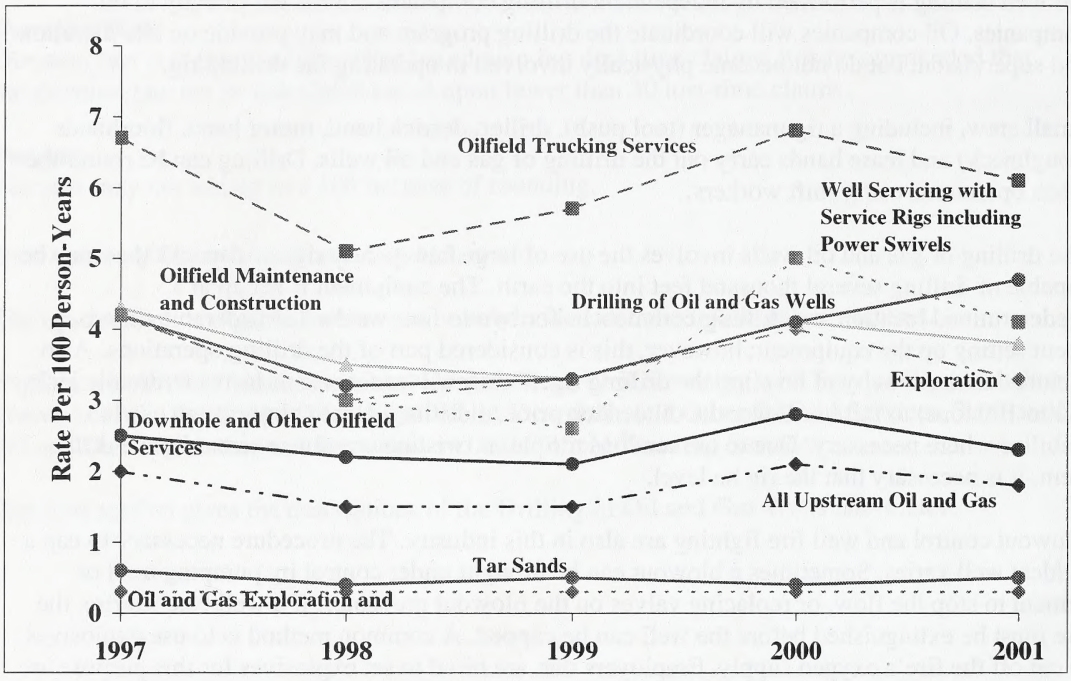
***Drilling of Oil and Gas well (Industry Code 09600)***
Oil well drilling is performed by independent drilling companies contracted directly to oil companies. Oil companies will coordinate the drilling program and may provide on site direction and supervision, but do not become physically involved in operating the drilling rig.

Small crew, including a rig manager (tool push), driller, derrick hand, motor hand, floorhands (roughneck) and lease hands carry out the drilling of gas and oil wells. Drilling can be round-the-clock operations using shift workers.

The drilling of gas and oil wells involves the use of large heavy-duty rigs or derricks that may be capable of drilling several thousand feet into the earth. The equipment is set up at a predetermined location and drilling commences for two to four weeks. Considerable time is spent setting up the equipment; however, this is considered part of the drilling operations. Also included is the activity of leveling the drilling rig. This involves the use of heavy hydraulic jacks (50 to 100 tons) to raise or lower the oil derrick prior to drilling. Heavy timbers are used to stabilize where necessary. Due to tremendous torque or twisting pressure exerted by the drill stem, it is necessary that the rig be level.

Blowout control and well fire fighting are also in this industry. The procedure necessary to cap a wildcat well varies. Sometimes a blowout can be brought under control by pumping mud or cement to stop the flow, or replacing valves on the blowout preventer. If a well catches fire, the fire must be extinguished before the well can be capped. A common method is to use explosives to cut off the fire's oxygen supply. Employers that are hired to set explosives for this purpose are covered in this industry.

# Lost-Time Claim Rate
# Upstream Oil and Gas Sub-Sectors
# Alberta: 1997-2001




| Lost-Time Claim Rate | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|
| All Upstream Oil and Gas | 2.0 | 1.5 | 1.5 | 2.1 | 1.8 |
| Exploration | 4.2 | 3.0 | 3.3 | 4.0 | 3.3 |
| Oilfield Maintenance and Construction | 4.3 | 3.5 | 3.3 | 4.1 | 3.8 |
| Well Services with Service Rigs | 4.2 | 3.2 | 3.3 | 4.1 | 4.7 |
| Drilling of Oil and Gas | 4.2 | 3.0 | 2.6 | 5.0 | 4.1 |
| Downhole and Other Oilfield Services | 2.5 | 2.2 | 2.1 | 2.8 | 2.3 |
| Tar Sands | 0.6 | 0.4 | 0.5 | 0.4 | 0.5 |
| Oil and Gas Exploration and Development | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| Oilfield Trucking Services | 6.7 | 5.1 | 5.7 | 6.8 | 6.1 |

# 3. Lost-Time Claim Rate and Duration Rate

*09600-Drilling of Oil and Gas Wells*

| Year | # of Accounts | Cost | Person Years | Days Lost | Duration Rate | LTCs | LTC Rate |
|---|---|---|---|---|---|---|---|
| 1997 | 79 | $2,661,066 | 6,871 | 13,995 | 204 | 289 | 4.2 |
| 1998 | 81 | $2,221,502 | 6,077 | 11,475 | 189 | 182 | 3.0 |
| 1999 | 83 | $1,336,103 | 5,137 | 7,899 | 154 | 133 | 2.6 |
| 2000 | 88 | $3,206,349 | 5,707 | 17,454 | 306 | 287 | 5.0 |
| 2001 | 92 | $3,563,783 | 6,012 | 12,324 | 205 | 245 | 4.1 |

## 3.1 Lost-Time Claim Rate by Size of Employer: 2001

| Size of Employer | # of Accounts | LTCs | Person - Years | LTC Rate |
|---|---|---|---|---|
| A: Less than 1 person-years | 44 | 2 | 12 | N/A |
| B: 1 to 4 person-years | 8 | 1 | 13 | N/A |
| C: 5 to 9 person-years | 3 | 1 | 22 | N/A |
| D: 10 to 19 person-years | 1 | 3 | 12 | N/A |
| E: 20 to 39 person-years | 10 | 24 | 292 | 8.2 |
| F: 40 to 99 person-years | 12 | 40 | 693 | 5.8 |
| G: 100 or more person-years | 12 | 172 | 4,968 | 3.5 |
| H: Unspecified | 2 | 2 | N/A | N/A |
| Total | 92 | 245 | 6,012 | 4.0 |

# 4. Analysis of the Lost-Time Claims

## 4.1 Nature of Injury

| LOST-TIME CLAIMS ALBERTA: 1997 TO 2001 | OCCURRENCE YEAR | | | | | Total | |
|---|---|---|---|---|---|---|---|
| | 1997 | 1998 | 1999 | 2000 | 2001 | Number | Percent |
| FRACTURE/DISLOCATION | 91 | 54 | 41 | 87 | 69 | 342 | 30.1 |
| SPRAIN, STRAIN, TEARS | 71 | 40 | 23 | 72 | 53 | 259 | 22.8 |
| OTHER TRAUMATIC INJURY/DISEASE | 33 | 22 | 18 | 30 | 30 | 133 | 11.7 |
| SURFACE WOUNDS, BRUISES | 33 | 18 | 18 | 30 | 26 | 125 | 11.0 |
| OPEN WOUNDS | 20 | 21 | 13 | 26 | 27 | 107 | 9.4 |
| SYSTEMATIC DISEASES, DISORDERS | 21 | 10 | 4 | 22 | 14 | 71 | 6.3 |
| BURNS | 8 | 11 | 2 | 12 | 10 | 43 | 3.8 |
| NATURE - UNS | 9 | 5 | 8 | 7 | 14 | 43 | 3.8 |
| MULTIPLE DISEASE/DISORDERS | 1 | . | 6 | . | 1 | 8 | 0.7 |
| SYMPTONS, SIGN/ILLNESS | . | 1 | . | 1 | 1 | 3 | 0.3 |
| OTHER DISEASE/DISORDERS | 2 | . | . | . | . | 2 | 0.2 |
| Total | 289 | 182 | 133 | 287 | 245 | 1,136 | 100.0 |

## 4.2 Type of Event or Exposure

| LOST-TIME CLAIMS ALBERTA: 1997 TO 2001 | OCCURRENCE YEAR | | | | | Total | |
|---|---|---|---|---|---|---|---|
| | 1997 | 1998 | 1999 | 2000 | 2001 | Number | Percent |
| STRUCK BY OBJECTS | 68 | 33 | 42 | 76 | 48 | 267 | 23.5 |
| CAUGHT IN OBJECTS | 48 | 44 | 23 | 48 | 47 | 210 | 18.5 |
| OVEREXERTION | 34 | 29 | 15 | 30 | 23 | 131 | 11.5 |
| FALL TO LOWER LEVEL | 39 | 18 | 11 | 18 | 23 | 109 | 9.6 |
| FALL ON SAME LEVEL | 23 | 12 | 15 | 13 | 26 | 89 | 7.8 |
| EXPOSURE TO HARMFUL SUBSTANCES | 11 | 16 | 4 | 17 | 18 | 66 | 5.8 |
| BODILY REACTION | 14 | 7 | 4 | 22 | 15 | 62 | 5.5 |
| STRUCK AGAINST OBJECTS | 8 | 5 | 1 | 6 | 9 | 29 | 2.6 |
| TRANSPORTATION ACCIDENTS | 5 | 2 | 5 | 8 | 7 | 27 | 2.4 |
| OTHER FALLS | 7 | 2 | 4 | 9 | 2 | 24 | 2.1 |
| REPETITIVE MOTIONS | 6 | 4 | 1 | 4 | 2 | 17 | 1.5 |
| OTHER BODILY REACTION/EXERTION | 2 | . | . | 3 | 1 | 6 | 0.5 |
| RUBBED OR ABRADED | . | . | 1 | 2 | 2 | 5 | 0.4 |
| FIRES AND EXPLOSIONS | 1 | . | . | 1 | . | 2 | 0.2 |
| OTHER CONTACT WITH OBJECT/EQUIP | . | 1 | . | 1 | . | 2 | 0.2 |
| ASSAULT/VIOLENT ACT BY PERSON | . | 1 | . | 1 | . | 2 | 0.2 |
| OTHER ASSAULTS/VIOLENT | 1 | . | . | . | . | 1 | 0.1 |
| UNKNOWN | 22 | 8 | 7 | 28 | 22 | 87 | 7.7 |
| Total | 289 | 182 | 133 | 287 | 245 | 1,136 | 100.0 |

## 4.3 Part of Body Injured

| LOST-TIME CLAIMS ALBERTA: 1997 TO 2001 | OCCURRENCE YEAR | | | | | Total | |
|---|---|---|---|---|---|---|---|
| | 1997 | 1998 | 1999 | 2000 | 2001 | Number | Percent |
| BACK | 50 | 32 | 19 | 44 | 31 | 176 | 15.5 |
| FINGER(S) | 34 | 34 | 23 | 36 | 38 | 165 | 14.5 |
| OTHER TRUNK | 37 | 19 | 15 | 45 | 34 | 150 | 13.2 |
| LEG(S) | 43 | 24 | 17 | 26 | 35 | 145 | 12.8 |
| ANKLE(S) & FOOT(FEET)-NOT TOES | 33 | 16 | 10 | 42 | 18 | 119 | 10.5 |
| OTHER HEAD | 16 | 12 | 14 | 24 | 23 | 89 | 7.8 |
| HAND(S) | 24 | 12 | 5 | 19 | 22 | 82 | 7.2 |
| OTHER UPPER EXTREMITIES | 26 | 13 | 12 | 9 | 10 | 70 | 6.2 |
| MULTIPLE BODY PARTS | 8 | 7 | 11 | 14 | 13 | 53 | 4.7 |
| OTHER LOWER EXTREMITIES | 5 | 6 | 4 | 10 | 6 | 31 | 2.7 |
| EYE(S)-OPTIC NERVE,VISION | 2 | 4 | 2 | 12 | 6 | 26 | 2.3 |
| NECK | 5 | 3 | 1 | 3 | 6 | 18 | 1.6 |
| BODY SYSTEMS | 4 | . | . | 2 | 2 | 8 | 0.7 |
| UNKNOWN | 2 | . | . | 1 | 1 | 4 | 0.4 |
| Total | 289 | 182 | 133 | 287 | 245 | 1,136 | 100.0 |

## 4.4 Source of Injury

| LOST-TIME CLAIMS ALBERTA: 1997 TO 2001 | OCCURRENCE YEAR | | | | | Total | |
|---|---|---|---|---|---|---|---|
| | 1997 | 1998 | 1999 | 2000 | 2001 | Number | Percent |
| PARTS & MATERIALS | 59 | 40 | 30 | 66 | 42 | 237 | 20.9 |
| STRUCTURES/SURFACES | 51 | 27 | 14 | 33 | 39 | 164 | 14.4 |
| MACHINERY | 27 | 18 | 15 | 21 | 24 | 105 | 9.2 |
| PERSONS-INJURED WORKER | 22 | 11 | 5 | 27 | 18 | 83 | 7.3 |
| HANDTOOLS-UNPOWERED | 20 | 12 | 10 | 12 | 17 | 71 | 6.3 |
| OTHER SOURCES | 5 | 11 | 7 | 27 | 20 | 70 | 6.2 |
| CONTAINERS | 9 | 7 | 10 | 6 | 10 | 42 | 3.7 |
| VEHICLES | 5 | 2 | 5 | 10 | 8 | 30 | 2.6 |
| OTHER TOOLS/EQUIPMENT | 6 | 4 | 7 | 8 | 2 | 27 | 2.4 |
| CHEMICAL/CHEMICAL PRODUCTS | 5 | 3 | . | 8 | 4 | 20 | 1.8 |
| FURNITURE & FIXTURES | 2 | . | 1 | 3 | 3 | 9 | 0.8 |
| PERSONS-NOT THE INJURED WORKER | . | 1 | . | 3 | . | 4 | 0.4 |
| HANDTOOLS-POWERED | 1 | 1 | . | 1 | . | 3 | 0.3 |
| PLANTS & ANIMALS | 1 | 1 | . | . | . | 2 | 0.2 |
| MINERAL-METALS/NONMETALS | 1 | . | . | . | . | 1 | 0.1 |
| OTHER PLANTS/ANIMALS/MINERALS | . | . | . | 1 | . | 1 | 0.1 |
| UNKNOWN | 75 | 44 | 29 | 61 | 58 | 267 | 23.5 |
| Total | 289 | 182 | 133 | 287 | 245 | 1,136 | 100.0 |

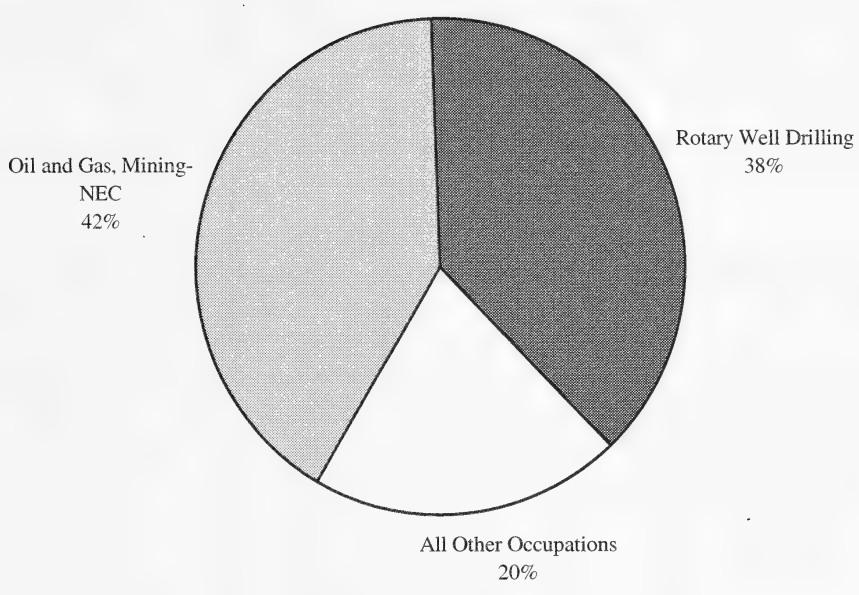
## 4.5 Duration of Disability

| LOST-TIME CLAIMS ALBERTA: 1997 TO 2001 | OCCURRENCE YEAR | | | | | Total | |
|---|---|---|---|---|---|---|---|
| | 1997 | 1998 | 1999 | 2000 | 2001 | Number | Percent |
| 01 - 05 DAYS LOST | 31 | 16 | 6 | 31 | 29 | 113 | 9.9 |
| 06 - 10 DAYS LOST | 31 | 10 | 12 | 20 | 21 | 94 | 8.3 |
| 11 - 15 DAYS LOST | 17 | 11 | 10 | 23 | 13 | 74 | 6.5 |
| 16 - 20 DAYS LOST | 12 | 12 | 6 | 11 | 12 | 53 | 4.7 |
| 21 - 30 DAYS LOST | 24 | 14 | 11 | 18 | 20 | 87 | 7.7 |
| 31 - 40 DAYS LOST | 22 | 13 | 10 | 22 | 12 | 79 | 7.0 |
| 41 - 50 DAYS LOST | 16 | 10 | 9 | 14 | 16 | 65 | 5.7 |
| 51 OR MORE DAYS LOST | 92 | 69 | 59 | 107 | 76 | 403 | 35.5 |
| DAYS LOST-UNSPECIFIED | 44 | 27 | 10 | 41 | 46 | 168 | 14.8 |
| Total | 289 | 182 | 133 | 287 | 245 | 1,136 | 100.0 |

# 5. Characteristics of the Injured Worker

## 5.1 Occupation of the Injured Worker

**Occupation of the Injured Worker**
**Alberta: 1997-2001**



## 5.2 Age of Injured Worker

| LOST-TIME CLAIMS ALBERTA: 1997 TO 2001 | OCCURRENCE YEAR | | | | | Total | |
|---|---|---|---|---|---|---|---|
| | 1997 | 1998 | 1999 | 2000 | 2001 | Number | Percent |
| 15-19 YEARS | 19 | 9 | 5 | 11 | 14 | 58 | 5.1 |
| 20-24 YEARS | 73 | 42 | 31 | 64 | 65 | 275 | 24.2 |
| 25-34 YEARS | 118 | 76 | 52 | 123 | 91 | 460 | 40.5 |
| 35-44 YEARS | 71 | 43 | 37 | 68 | 55 | 274 | 24.1 |
| 45-54 YEARS | 5 | 7 | 6 | 16 | 13 | 47 | 4.1 |
| 55-64 YEARS | 3 | 4 | 2 | 3 | 2 | 14 | 1.2 |
| 65 YEARS AND OVER | . | 1 | . | 1 | 3 | 5 | 0.4 |
| AGE-UNSPECIFIED | . | . | . | 1 | 2 | 3 | 0.3 |
| Total | 289 | 182 | 133 | 287 | 245 | 1,136 | 100.0 |

## 5.3 Length of Time Employed

| LOST-TIME CLAIMS ALBERTA: 1997 TO 2001 | OCCURRENCE YEAR | | | | | Total | |
|---|---|---|---|---|---|---|---|
| | 1997 | 1998 | 1999 | 2000 | 2001 | Number | Percent |
| A. LESS THAN 1 MONTH | 68 | 27 | 24 | 64 | 31 | 214 | 18.8 |
| B. 1 MONTH TO LESS THAN 6 MONTHS | 84 | 34 | 22 | 53 | 45 | 238 | 21.0 |
| C. 6 MONTHS TO LESS THAN 1 YEAR | 21 | 20 | 6 | 24 | 12 | 83 | 7.3 |
| D. 1 YEAR OR MORE | 40 | 25 | 38 | 37 | 20 | 160 | 14.1 |
| E. TIME-UNSPECIFIED | 76 | 76 | 43 | 109 | 137 | 441 | 38.8 |
| Total | 289 | 182 | 133 | 287 | 245 | 1,136 | 100.0 |

## 5.4 Gender of Injured Worker

| LOST-TIME CLAIMS ALBERTA: 1997 TO 2001 | OCCURRENCE YEAR | | | | | Total | |
|---|---|---|---|---|---|---|---|
| | 1997 | 1998 | 1999 | 2000 | 2001 | Number | Percent |
| MALE | 283 | 179 | 130 | 285 | 239 | 1,116 | 98.2 |
| FEMALE | 2 | 1 | 2 | 2 | 1 | 8 | 0.7 |
| GENDER-UNSPECIFIED | 4 | 2 | 1 | . | 5 | 12 | 1.1 |
| Total | 289 | 182 | 133 | 287 | 245 | 1,136 | 100.0 |

## 6. Cost of Claims and Employer Premiums

*Upstream Oil and Gas Sub-Sector #4: Drilling of Oil and Gas Wells*

| | *Occurrence Year* | | | | |
|---|---|---|---|---|---|
| **Transaction Year** | **1997** | **1998** | **1999** | **2000** | **2001** |
| **1997** | $2,297,077 | | | | |
| **1998** | $2,161,716 | $1,815,786 | | | |
| **1999** | $2,988,285 | $1,494,894 | $1,376,298 | | |
| **2000** | $1,495,960 | $1,903,797 | $1,783,367 | $2,660,481 | |
| **2001** | $2,066,625 | $953,099 | $1,250,425 | $3,374,334 | $3,375,936 |
| **Total Cost** | **$11,009,663** | **$6,167,576** | **$4,410,090** | **$6,034,815** | **$3,375,936** |
| **Total Premiums** | **$13,483,016** | **$8,014,337** | **$5,528,923** | **$10,085,954** | **$13,851,002** |

The above claim cost and employer premiums are for the five-year period 1997 through 2001. The data are as of May 4, 2002.

The cost of claim amount reflects only paid cost on claims that have occurred in the five-year period. The claim costs are tracked by occurrence year and the year that the costs were transacted.

The premiums are the total of all employers' premiums paid in each year and are calculated by the rate year.

## 7. Occupational Fatalities

An occupational fatality is the death of a worker that results from a work-related event or exposure. AHRE classifies occupational fatalities into three general types: motor vehicle incident, workplace incident and occupational diseases. Each is described in detail below.

### *Motor Vehicle Incident*

Motor vehicle incidents typically involve highway vehicles operating on public roads in which the fatally injured worker was either the driver or a passenger. This category also includes fatalities involving aircraft crashes, train crashes, helicopter crashes, and water vehicle crashes.

### *Workplace Incident*

Fatal workplace incidents consist of cases in which the worker dies at a work site, or as a result of injuries sustained at a work site. It is this type of fatality that AHRE may be responsible for investigating.

### *Occupational Diseases*

Occupational disease fatalities consist mostly of recognized occupational disease, that is, disease known to be primarily or exclusively work-related (e.g,. asbestosis, black lung disease). Occupational diseases are frequently diagnosed many years after the initial or crucial exposure to the toxic substance, and in such cases it is very difficult to determine when the fatal exposure occurred. Thus, the occupational disease category should not be interpreted to reflect present work site hazardous conditions or exposures.

Each year the WCB accepts some occupational fatality claims for compensation. Occupational fatality claims that were accepted in a particular year may include fatalities from prior years.

## Description of Drilling of Oil and Gas Wells Workplace Fatalities Accepted by the Workers' Compensation Board Alberta: 1997-2001

| YEAR | Motor Vehicle Incidents | | Workplace Incidents | | Total | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| 1997 | 1 | 33.3 | 2 | 66.7 | 3 | 100 |
| 1998 | 1 | 100.0 | 0 | 0 | 1 | 100 |
| 1999 | 0 | 0 | 1 | 100.0 | 1 | 100 |
| 2000 | 0 | 0 | 3 | 100.0 | 3 | 100 |
| 2001 | 1 | 20.0 | 4 | 80.0 | 5 | 100 |
| Total | 3 | 23.1 | 10 | 76.9 | 13 | 100 |

## 8. Description of Workplace Fatalities Investigated by Occupational Health and Safety: 1997 to 2001

YEAR: 1997 FILE: 0862
OCCUPATION: Floor Hand AGE: 20
INDUSTRY: Drilling of Oil and Gas Wells
EXPERIENCE: Less than one year

DESCRIPTION: The drilling crew was in the process of tripping out drill pipe, when they came to a set of cross over subs. These subs are used to adapt parts of the drilling string, which cannot otherwise be screwed together because of the difference in thread size or design. The crew attached the tongs to the collars and sub and applied torque to break open the joint between the two. The lead tong (tongs are the large wrenches that are latched onto drill pipe or drill collars in order to make up "tighten" or break out "loosen" joint or drill pipe or drill collars) latch lug jaw failed, broke off, and struck the worker in the head fatally injuring him.

YEAR: 1997 FILE: 0877
OCCUPATION: Floorhand AGE: 22
INDUSTRY: Drilling of Oil and Gas Wells
EXPERIENCE: Unknown

DESCRIPTION: An oilrig crew was finishing the process of laying down an oilrig derrick on two bedtrucks, in preparation for the rig move. The worker assisted a gin pole truck operator in rigging the A-leg section of a mast so a spreader bar could be removed and the A-leg lowered. The A-leg was secured to a lifting lug, which was attached to a hook and winch line of a gin pole truck. The worker removed a pin that secured a spreader bar to the derrick and then climbed onto the derrick to remove the spreader bar. The worker polled the spreader bar off, lost his balance and fell forward under the suspended A-leg. Simultaneously, the lifting lug used in lowering and raising the A-legs failed. The A-leg fell on the worker, causing fatal injuries.

YEAR: 1999 FILE: 0918
OCCUPATION: Lease Hand AGE: 25
INDUSTRY: Drilling of Oil and Gas Wells
EXPERIENCE: 39 months on rigs / 69 days on Rig #159SL

DESCRIPTION: The worker was resetting the pipe handling system at the drill rig. To facilitate the pipe transfer process, the transfer arm was to be repositioned to the next tier of drill pipes. A drill pipe, left from the previous transferred layer, was resting on the transfer arm. The worker lost control of the transfer arm when he attempted to reposition it. The drill pipe resting on the transfer arm rolled down and struck the worker on the head. The worker died from serious head injuries.

YEAR: 2000 FILE: 0968
OCCUPATION: Derrickhand AGE: 53
INDUSTRY: Drilling of Oil and Gas Wells
EXPERIENCE: 20 Years

DESCRIPTION: The truck driver was in the process of moving a drilling rig to a lease site. He tried to place the equipment in its proper operating position.

The shack was loaded onto the flatbed. The truck driver tried to back the manifold shack from the flatbed into it's operating position with assistance from a designated swamper, but movement was restricted due to the smaller size of the lease. The driver decided to back his truck to the lease entrance but did not tell the swamper of his intentions. The truck driver started to back up without direction from the swamper. The driller and derrickhand were standing south of the drilling rig's substructure. The driller instructed the derrickhand to get the operator and the dozer to remove some soil by the mud tank. The derrickhand walked away towards the dozer. He was facing away from the truck that was backing up. The truck had an audible back-up alarm system, but the alarm was shut off.

The manifold shack that was hanging off the roll bar knocked the derrickhand down and the truck backed over him.

YEAR: 2000 FILE: 0976
OCCUPATION: Unknown AGE: 32
INDUSTRY: Drilling of Oil and Gas Wells
EXPERIENCE: Unknown

DESCRIPTION: A worker was killed when the travelling block on a drilling rig fell to the rig floor. During the drilling process, the drill collars twisted off down the hole. The drilling crew had been removing the pipe out of the hole to retrieve the drill collars when the travelling block contacted the crown, severing the hoisting line.

| | | | |
|---|---|---|---|
| YEAR: | 2001 | FILE: | 990 |
| OCCUPATION: | Motorman | AGE: | 29 |
| INDUSTRY: | Drilling of Oil and Gas Wells | | |
| EXPERIENCE: | Moderate | | |

DESCRIPTION: The crew was drilling a gas well and had already made five pipe connections. The motorman and a floor-hand were attempting to reconnect a hydraulic hose that had become disconnected from the kelly spinner. A driller noticed the two workers on the rig floor. He went to the control panel and disengaged the auto-driller in preparation to make another drill pipe connection. The swivel on the auto-driller seized, the balls swung out and struck the motorman and the floor-hand. Both workers were taken to hospital where the motorman was pronounced dead.

**Note: There were three fatalities in 2001 that are still under investigation.**

# Appendix A: Terms, Definitions, and Formulas

**Lost-Time Claim**

A lost-time claim (LTC) is a claim for an occupational injury or disease, which disables the worker beyond the day of injury. Included are claims for which wages compensation are paid, permanent disability claims, fatalities, and cases in which the injured worker is assigned light duties or other modified work.

**Person-Years**

Person-year estimates are calculated from wage and payroll data provided by account holders to the WCB. Alberta Human Resources and Employment uses these data to estimate an average industry wage, and uses the average industry wage and employer payroll data to estimate person-years for each employer and each industry. One person-year is equivalent to one full-time worker working for one year, and can be assumed to equal 2,000 hours worked.

**LTC Rate**

The lost-time claim (LTC) rate is calculated by dividing the number of lost-time claims by the person-year estimate, and multiplying the result by 100. The LTC rate represents the probability or risk of disabling injury or disease to a worker during a period of one-year work. Comparisons of LTC rates between industries, or between years, can be used to indicate increases, decreases, or differences in this risk.

$$\text{LTC Rate} = \frac{\text{Number of LTCs X 100}}{\text{Estimated Person-years}}$$

**Duration (Days Lost)**

The duration of disability is the number of days following the injury or disease for which the worker was disabled, and unable to perform normal work duties. This information is obtained for this report from data on compensation days paid on each claim from WCB. Alberta Human Resources and Employment obtains these data on March 31 of the year following the claim year, and does not update the information, even though many injured workers continue to be disabled beyond this date. As a result, the duration information reported here underestimates the true impact of lost-time injury and disease.

**Duration Rate**

The duration rate is calculated by dividing the number of workdays lost (disability days) by the person-year estimate, and multiplying by 100. The result is expressed as days lost per 100 person-years worked, and indicates, in part, the economic impact of occupational injury and disease. Duration rates are not recommended as reliable indicators of full economic cost. In addition, readers are warned that duration rates are highly unstable when based on only a few lost-time claims; it is recommended that the duration rate not be calculated based upon fewer than 30 lost-time claims.

$$\text{Duration Rate} = \frac{\text{Disability Days X 100}}{\text{Estimated Person-Years}}$$

**WCB Accepted Fatality**

An occupational fatality is the death of a worker which resulted from a work-related incident or exposure and which has been accepted by the WCB for compensation. A fatality is counted in the year it is accepted.

**NEC**

Means 'Not Elsewhere Classified'.

**UNS**

Means 'Unspecified'.

## Appendix B: Upstream Oil and Gas 2001 Industry Codes

**Sub-Sector #1:** **Exploration**
Industries: 09200-Seismic Geophysical and Mineral Exploration
09201-Shot Hole Drilling

**Sub-Sector #2:** **Oilfield Maintenance and Construction**
Industries: 06304-Oilfield Construction and Maintenance (Upstream of Processing Plants)

**Sub-Sector #3:** **Well Servicing with Service Rigs**
Industries: 09903-Well Servicing with Service Rigs including Power Swivels

**Sub-Sector #4:** **Drilling of Oil and Gas Wells**
Industries: 09600-Drilling of Oil and Gas Wells

**Sub-Sector #5:** **Downhole and Other Oilfield Services**
Industries: 06305-Field Production Operators
06306-Vacuum Removal of Waste-Industrial, Commercial and Oilfield
09900-Mud Logging
09902-Pressure Cleaning Services
09904-Rathole Drilling and Service Rig Anchoring
09911-Oilfield Downhole Services
09915-Well Casing Services
09921-Servicing Christmas Trees on Oil Wells by Means of a Tree Saver
09927-Liquid Waste Treatment and Disposal

**Sub-Sector #6:** **Tar Sands**
Industries: 06600-Mining and Processing of Bituminous Sand for Oil Extraction
06601-Research and Development, Oil Sands and Heavy Oil Recovery

**Sub-Sector #7:** **Oil and Gas Exploration and Development**
Industries: 06300-Oil and Gas Exploration and Development-Upstream Operations

**Sub-Sector #8:** **Oilfield Trucking Services**
Industries: 50720-Oilfield Trucking Services

**For Further Information Contact:**

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Alberta Workplace Health and Safety website:
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